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recently held in London to consider the connection of the Egyptian telegraph lines now reaching Khartum with those existing at Kimberley in the extreme south of Africa. The Central African Telegraph Company are already making arrangements to run a line from the Transvaal to Zanzibar.

OBITUARY.—Dr. August Heinrich Petermann died at Gotha, on the 26th of September. This very eminent geographer was born at Bleicherode, a village of Prussian Saxony, April 18, 1822. Educated at the Potsdam Geographical Institute, founded by Berghaus, the well known author of the "Physical Atlas," he afterwards became his secretary and assistant in preparing the maps for his great work, and also for that of Alexander von Humboldt on Central Asia. Removing to Edinburgh in 1845, and afterwards to London, he aided largely in the bringing out of Dr. A. K. Johnston's "Physical Atlas" and other geographical works, took an active part in the proceedings of the Royal Geographical Society, and was instrumental in sending Drs. Barth, Overweg and Vogel to Central Africa. In 1854, he undertook the charge of the great geographical establishment of *Fustus Perthes*, at Gotha, where he remained until his death, founding and conducting with great success the *Mittheilungen aus Fustus Perthes' Geographischer Anstalt über Wichtige neue Erforschungen auf dem Gesamtgebiete der Geographie*, a monthly periodical whose volumes constitute an almost complete record of the progress of geographical discovery since that date, illustrated by a vast number of maps and plans. The first and second North German Expeditions to the North Pole were sent out under his direction and material support. The new edition of Stieler's "Hand-Atlas" (1875), contains many maps drawn by him, including the best, for their size, that have yet appeared of the western portion of the United States. The loss, at a comparatively early age, of one whose untiring industry and enthusiastic devotion has so greatly aided in extending the bounds of civilization, is deeply deplored.

MICROSCOPY.¹

NATIONAL MICROSCOPICAL CONGRESS (*Continued*).—"The Migration of Leucocytes," by Dr. W. T. Belfield, of Chicago. In examining microscopic sections of the kidneys of persons who had died of pneumonia, the author had found the intertubular tissue crowded with an abundance of cells having all the appearance of white blood corpuscles. As other appearances of renal inflammation were wanting, and there had been no previous history of renal disease, it was judged that the retardation of the blood current incident to the pneumonia had furnished the occasion for the escape, from the capillaries, of the blood corpuscles by means of their amœboid movements. To test and study this fact of migration of leuco-

¹ This department is edited by Dr. R. H. Ward, Troy, N. Y.

cytes in passive hyperæmia, frogs were curarized, the femoral vein exposed by dissection, and pressure applied by means of an India rubber band and a plug of cork. The web of the corresponding foot was stretched upon the stage of the microscope, and the pressure upon the vein regulated so as to retard the current of blood without producing complete stagnation. That the effects produced were due to passive and not to active hyperæmia, to mechanical congestion and not to inflammation, is shown by the absence of other phenomena of inflammation, and by the fact that discontinuance of the pressure on the vein was immediately followed by full restoration of the circulation. In one instance, migration was observed within three hours after compression was made, but in others no migration was detected within the first nine hours. Sooner or later, in all cases, leucocytes were seen to leave the vessels in considerable numbers, not usually from the minutest capillaries but from the large capillaries and small veins of from $\frac{1}{1600}$ to $\frac{1}{1600}$ of an inch in diameter. Emigration also occurred where the currents were rapid and sparsely supplied with corpuscles, as well as from slow currents crowded with corpuscles. The time of exit averaged from one to two hours, but was sometimes as short as twenty minutes. The method of locomotion did not, of course, differ from that exhibited in inflammation, though excessive change of form, and protrusion of long processes, was not noticed. Frequently a leucocyte flattened against the wall, then a bud appeared external to the wall, and the intra-vascular portion gradually shrank away as this bud increased in size. Often the locomotion was continued after the leucocyte had wholly left the vessel, so that it traveled several times its own diameter from the place of exit. Other corpuscles, too, were prone to pass out at the same point, so that sometimes several would be crowded together within the vascular wall, and an hour later would be in close proximity external to the vessel opposite the same point. Certain red corpuscles of the same shape and size, and without a nucleus, but of unmistakably red color, were frequently seen to migrate in a similar manner, and to such an extent that after thirty-six hours there were many patches in the field which looked almost like hemorrhages. That they were not hemorrhages was inferred, because many of them had been seen to migrate, because they were fixed in the tissue, and not floating in the blood serum, and because they were all small and round, and different from the large, oval, nucleated red corpuscles of the animal experimented upon. This behavior of the small red corpuscles exhibits a close relation with the white, and furnishes another link in the chain of circumstantial evidence that the red corpuscles are transformed white ones. The facts observed would seem to favor the theory that the migration is a simple filtration of colloid substances, from increased blood pressure and diminished blood velocity, rather

than an active movement due to their "glutinosity." How far these facts account for the connective tissue hyperplasia which accompanies varicose veins, the enlargement of the spleen which usually follows portal obstruction, etc., depends upon one's ideas of pathogenesis.

"A Handy Rule for use in Micrometry," by C. M. Vorce, of Cleveland, described very clearly the methods adopted by the author in making microscopical measurements.

Professor Romyn Hitchcock, of New York, in a paper entitled, "A Standard Micrometer," urged the adoption of a standard which should give some uniformity in micrometric work by different observers. Efforts to secure this end have been made, years ago, but they seem to have led to no results. We are now as far from a definite standard as ever, and the question can only be settled by a representative body like this, or by one convened for the special purpose. Not only accuracy but uniformity is essential, for convenience in reading and comparing observations. A fraction of an inch might seem the preferable unit of measurement to us in this country, but it can never become universal. The metric system is the only one that can ever become universal, and we should now adopt it even at some temporary sacrifice of convenience.

Professor Rogers, whose facilities for accurate ruling have been greatly increased during the last few months, proposes to rule six scales, as nearly alike as possible, and donate five of them to the same number of microscopical societies, as standards, the societies having first appointed a committee to examine, compare, and approve the scales. (Near the close of the Congress, resolutions were offered by Professor Hitchcock, and adopted, recommending $\frac{1}{100}$ of a millimetre as our unit of micrometry, requesting microscopical societies to formally adopt this standard, and recommending to the favorable consideration of the societies, Professor W. A. Rogers plan for the acquisition and distribution of standard scales. This action was taken by the Congress without opportunity for discussion, and for the purpose of bringing the matter before the country for concerted action. It is possible that the unit suggested will need reconsideration, as one millimetre might be more convenient and more easily agreed upon than a nameless fraction).—(*To be Continued.*)

EXCHANGES.—Lake Michigan diatoms, mounted or raw material, also diatoms of Northern Illinois, for good slides or material. B. W. Thomas, 132 La Salle street, Chicago, Illinois.

Diatoms: *Rhabdonema adriatica*, *Synedra ulna*, *splendens* and *superba*, *Tabellaria flocculosa*, *Fragilaria virescens*, *Isthmia nervosa*, diatomaceous earths and other unmounted material, for named diatoms or other good mounted objects. M. A. Booth, Longmeadow, Mass.

Slides of named diatoms, also peristome of *Funaria hygros-*

metrica, offered in exchange. Jos. McKay, 24 Liberty street, Troy, N. Y.

A variety of interesting objects from the Bahamas, mounted or unmounted, for exchange. C. C. Merriman, Rochester, N. Y.

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SCIENTIFIC NEWS.

— We learn from the parties in the field in the Yellowstone National Park, that the work of Prof. Hayden's United States Geological Survey of the Territories has progressed most favorably despite the unsettled nature of the country, owing to the Indian troubles. The general features of the park have been exhaustively surveyed, an enormous amount of material in the morainal deposits and especially the structure of the Wind River mountains.

Meanwhile the reports of the survey, and particularly the Geological map of Colorado lately issued by this Survey, are winning golden opinions in Europe. A gentleman writes us from Paris as follows: "The Hayden Survey is popular in both England and France. I repeatedly heard expressions of regret that there should be any disposition to hamper or oppose it in any way. Such opposition would be looked on here as springing, without doubt, from unworthy motives." An elaborate notice by Mr. Oldham, the late distinguished director of the Geological Survey of India, appears in the *Geological Magazine*, in which the highest praise is given to the work. That all Americans should take pride in this great work and others of the kind, is made apparent by the favorable notices which have appeared in European journals. In letters lately received at the office of the survey, Prof. Andrew C. Ramsay, the veteran director of the Geological Survey of Great Britain, writes: "I have to-day received a copy of your Colorado Atlas, for which I am exceedingly obliged. I have all the maps, etc., spread out on one of the large drawing tables in the geological survey office, and have had a long look at them. The beauty of the engraving and coloring is most remarkable, and quite astonished me. I know nothing of the kind superior, or even equal to this work, especially when we consider the physical character of the country and the hardships that such a survey must entail. That so much has been done, and done in such a manner, speaks volumes for the energy and skill of you and all your men, and it is a credit to any government to have been the means of producing such a masterly piece of work."

Prof. Archibald Geikie, director of the Geological Survey of Scotland, writes: "Your magnificent Atlas of Colorado has just come. I have had time merely to look over the maps and sections in a cursory way. But I cannot delay to send you a few